

**A VARIATIONAL METHOD FOR MULTI-DIMENSIONAL
LINEAR INVERSE HEAT CONDUCTION PROBLEMS¹**

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Abstract

In this paper we present a general setting of linear multi-dimensional inverse heat conduction problems (IHCPs) and suggest a variational method for solving them. The idea of the method is to minimize a defect functional with respect to the *unknown* initial temperature and the *unknown* heat flux at the inaccessible surface. We prove the Fréchet differentiability of the functional, give the formulas for the gradient, and, as a consequence, we can apply gradient methods for solving IHCPs in a stable way.

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